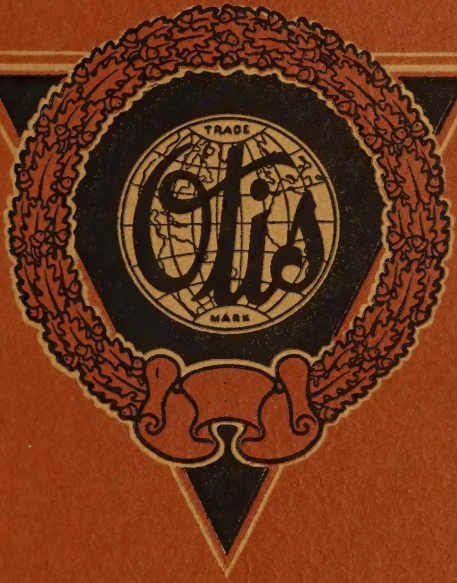
29

OTIS
SKIP HOISTS
AUTOMATIC OPERATION

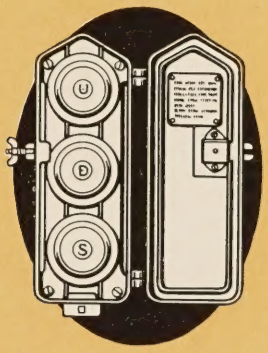


OTIS ELEVATOR COMPANY

OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD

DESIGNED AND PRINTED BY
OTIS ELEVATOR COMPANY
PRINTING DEPARTMENT

OTIS
SKIP HOISTS
AUTOMATIC OPERATION



OTIS ELEVATOR COMPANY
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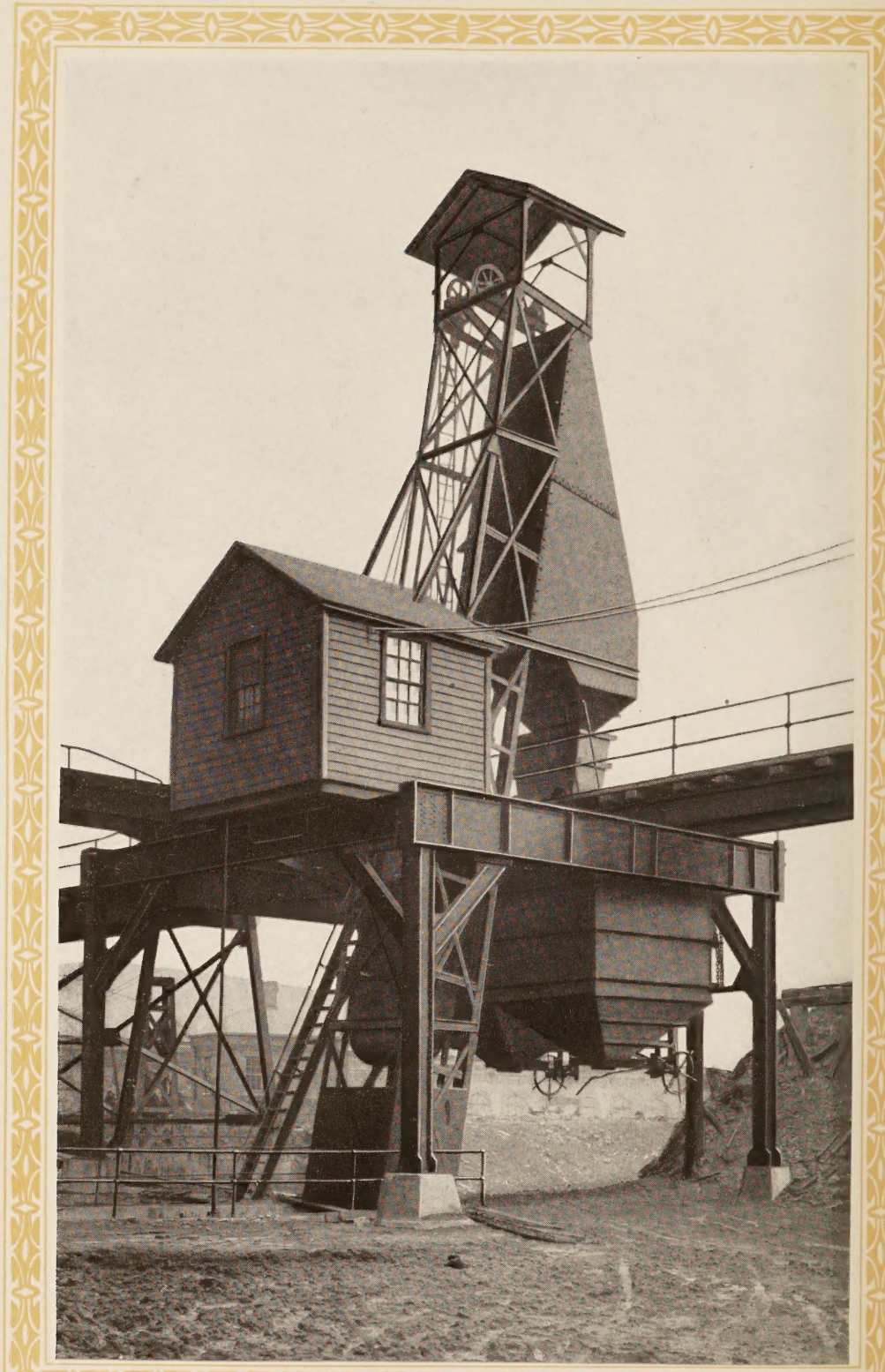


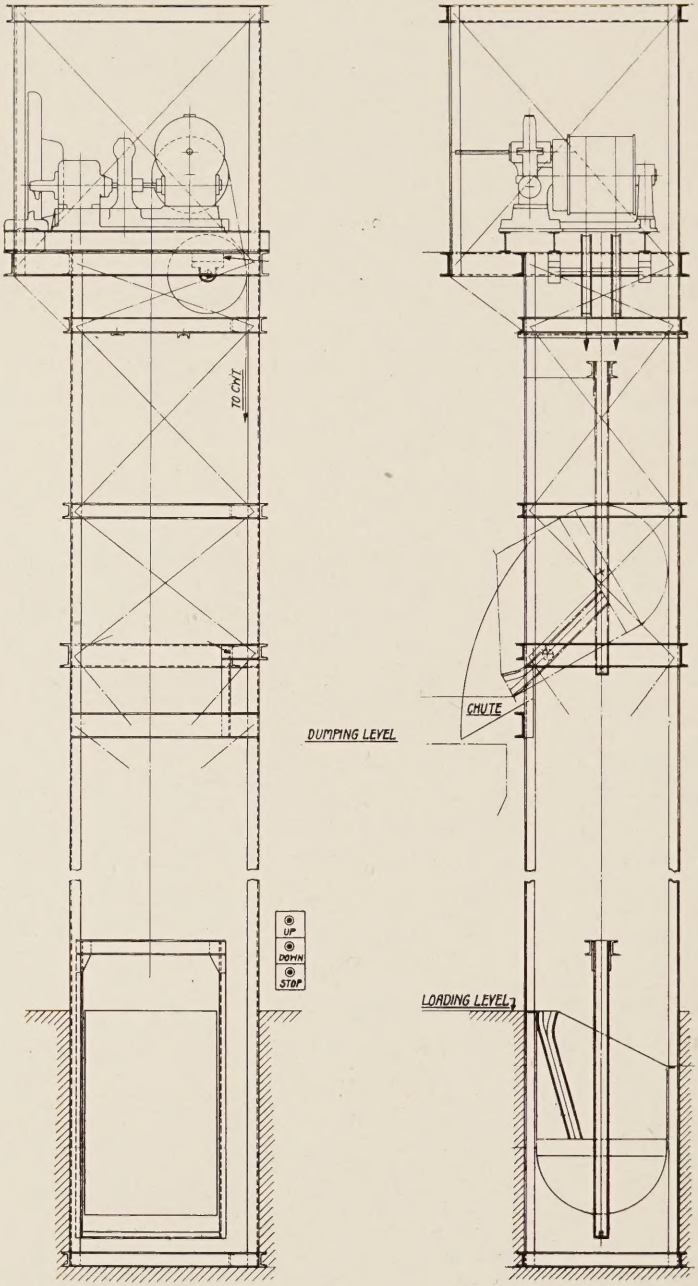
OTIS
SKIP HOISTS
AUTOMATIC OPERATION

For the Speedy and Efficient Handling of Coal, Ashes and Similar Materials in Gas Plants, Central Stations, Mining Plants, Factories, Etc.

The Otis automatic push button controlled Skip Hoist as illustrated and described on the following pages is intended to meet a growing demand for high grade reliable apparatus for raising various materials in bulk, such as coal, ashes, etc., and automatically delivering them at a higher level.

One of the chief causes contributing to the demand for automatic apparatus of this nature is the increasing scarcity of manual labor, which results in a demand for equipment that will reliably perform the work previously done by manual methods. A prime requisite of automatic apparatus for hoisting materials is reliability, and this has always been the first consideration in the design and selection of the apparatus and material used in building Otis Automatic Skip Hoists.

Particularly must the hoisting machine and controlling apparatus be of the most rugged and correct design, as any failure to properly perform their functions would result, in most cases, in costly delays, and thus defeat the purpose for which the apparatus was installed.



Typical Layout of Otis Automatic Push Button Skip Hoist
with Machine Located at Top of Hoistway.
Arranged for Vertical Hoisting.

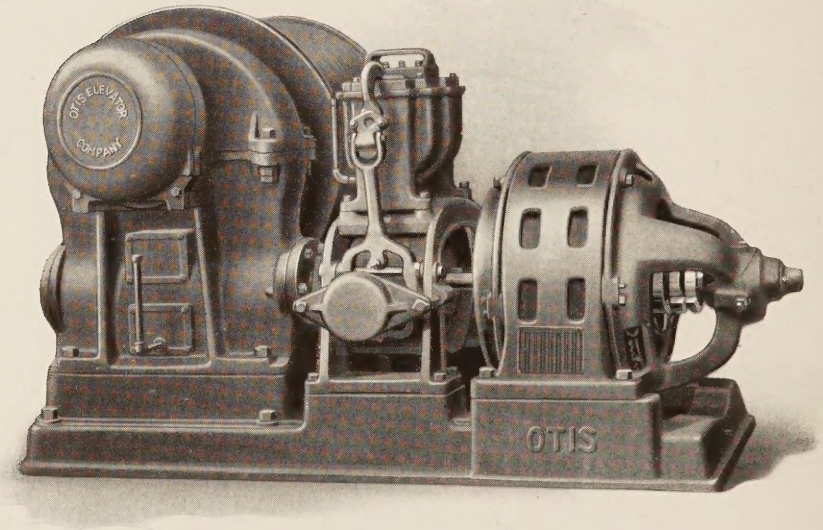
To meet these exacting requirements the Otis Elevator Company takes advantage of its line of hoisting machines which have been developed and refined for regular elevator service, and the customer therefore obtains all the advantages of owning and operating thoroughly standardized and well tried apparatus. The usual skip hoist control system also is nearly identical with that used on certain classes of regular freight and passenger elevator installations.

Next in importance to the question of reliability and proper design in the minds of the operating force of any plant is the consideration of the facility and quickness with which they can secure spare parts. Since we use standard elevator apparatus on skip hoist installations and due to the fact that Otis Service offices are located in all the important cities and towns of the United States, as well as in the principal cities in other parts of the world, it is always possible to secure promptly any renewal parts which may be required, as spare parts for standard elevator machines and controllers are kept in stock at all of our Service offices.

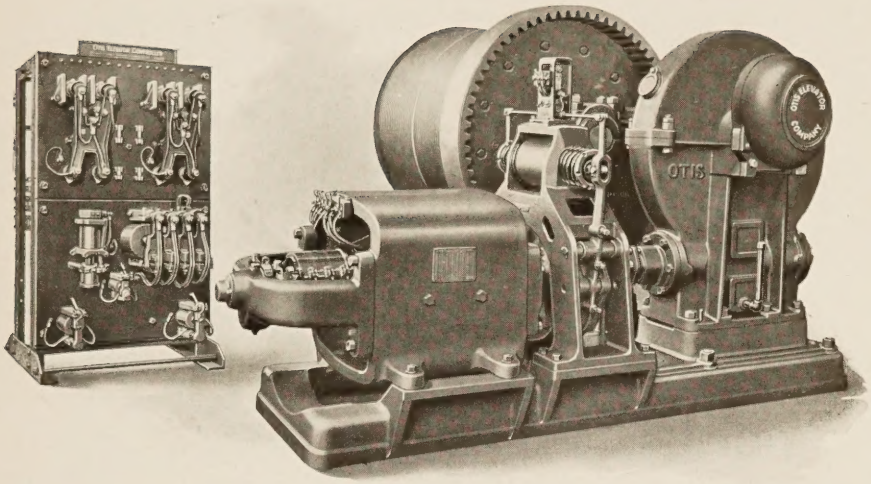
Otis Skip Hoists may be divided into two classes according to whether the bucket for carrying the load travels vertically or on an incline. Both vertical and incline hoists may be equipped with a single hoisting bucket, which may or may not require a counterweight, or with two hoisting buckets running on separate tracks, the one acting as the counterweight for the other.

For the duties generally found in handling coal, ashes, etc., in Manufacturing Plants and

Central Power Stations, it is, as previously explained, our practice to use standard elevator hoisting machines. These can be located either overhead or at ground level, adjacent to the hoistway. The usual machine consists of a single or double drum (according to whether a single or double skip arrangement is used), a worm gear reduction, an electrically-released, spring-applied shoe brake, and a motor, all of these parts being mounted on a heavy cast iron base plate to preserve alignment. The illustration below clearly shows the arrangement. Where an extra heavy load is to be handled at slow speed an additional speed reduction is frequently employed, consisting of a pinion engaging with an internal cut gear mounted on the hosting drum. This arrangement is shown in the illustration on page 7.



Otis Alternating Current Hoisting Machine.



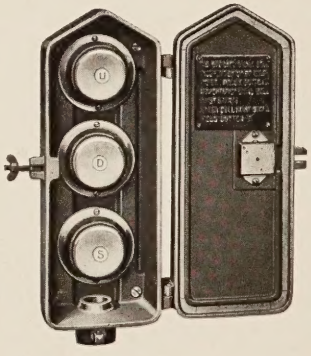
Otis Direct Current Internal Geared Hoisting Machine and Controller.

The control system generally furnished is an important feature of Otis Skip Hoist apparatus, as its action is entirely automatic. The operation is by means of three push buttons marked "Up", "Down" and "Stop". These are mounted in a box, as illustrated on page 8, and can be located wherever most convenient. When the bucket has received its load the attendant presses the "Up" button which causes the machine to start, and from this point the operation is entirely automatic. The machine accelerates to full speed, the bucket rises to the upper level, and at the proper point the machine slows down and the bucket travels into the dumping position, where on single skips it stops and automatically remains for a pre-determined interval which is sufficient to allow the material to be entirely discharged from the bucket. The machine then automatically starts in the "down"

direction and continues in operation until the bucket reaches the lower level and automatically stops in the loading position. A pressure of the "Stop" button at any time during the travel of the bucket will cause the machine to come to rest. If the "Up" button is then pressed, the bucket will continue in its normal cycle as above described, and if the "Down" button is pressed, the bucket will return to the loading position at the bottom.

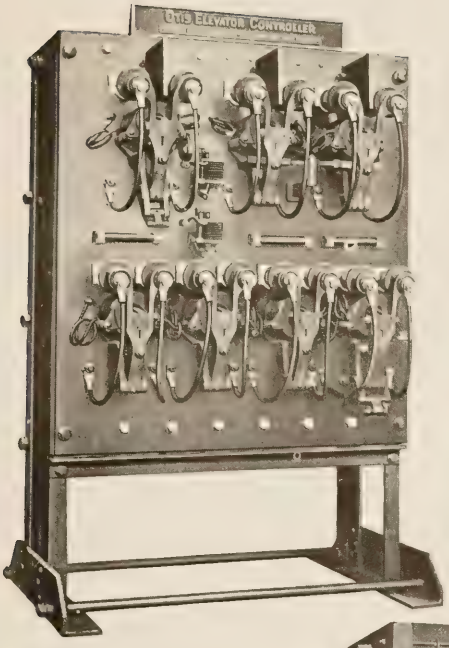
In the case of a double skip hoist, when the ascending bucket reaches the dumping position the machine remains stationary until it is again started by the operator at the loading point, he having in the meantime attended to the loading of the other bucket.

The advantages of an automatic control system such as above described are very great. The attendant is enabled to go ahead with other work as soon as he has pressed the button which starts the hoist. The push button control is entirely independent of the class of labor used, since the stopping and dumping are not dependent upon manipulation of the operating button, hand rope or switch, as is the case with non-automatic control systems.



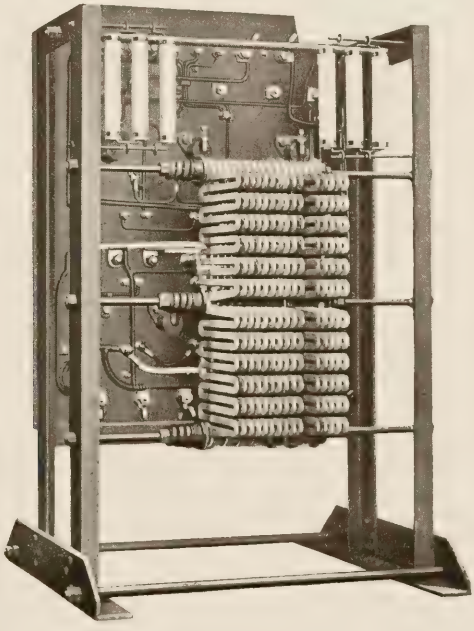
Push Button Box showing Up, Down, and Stop Control Buttons.

It is possible to eliminate an operator entirely by arranging the bucket so that it is loaded automatically, and when a predetermined load has



Front View.

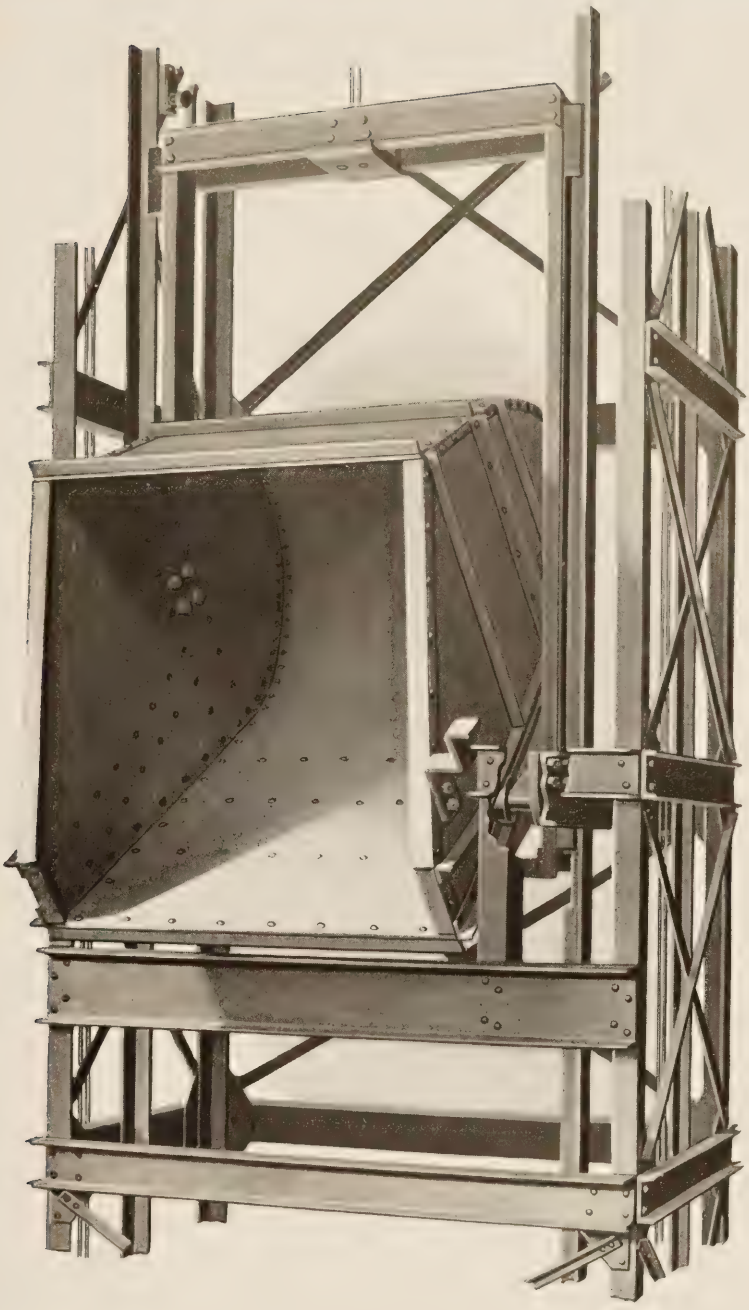
Back View.



Otis Alternating Current Controller as used with Otis Automatic Push Button Skip Hoists.

been received a contact is made which is equivalent to the pressure of the "Up" button by an operator. The machine then starts, and the bucket ascends, automatically closing the gate on the loading chute in passing, and continues upward to the dumping position, then dumps, descends, opens the loading gate in passing, stops, and reloads, this continuous automatic operation ceasing only when the supply of material is not sufficient to fill the bucket. Push Button Control may be furnished as an auxiliary method of operation. This system can be used with either single or double skips.

The bucket usually furnished for vertical skip hoists, either of the single or double skip type, is made of heavy steel plates reinforced with structural shapes, and provided with two cams symmetrically located on each side of the bucket. These cams are made of channels or angles properly shaped, and riveted to the bucket. The bucket is supported in a steel frame or sling by means of two trunnions, and is held in an upright position and guided during its travel by means of two steel brackets bearing against angle iron guides. These guides, which are fastened to the sides of the hoistway, control the travel of the bucket. As the bucket approaches the upper limit of the travel the cams engage with a pair of rollers mounted securely at the sides of the hoistway. The action of the cams and rollers causes the bucket to swing from the vertical position until it reaches an angle at which the material contained in the bucket can freely slide into the chute, hopper or other receptacle provided for this pur-



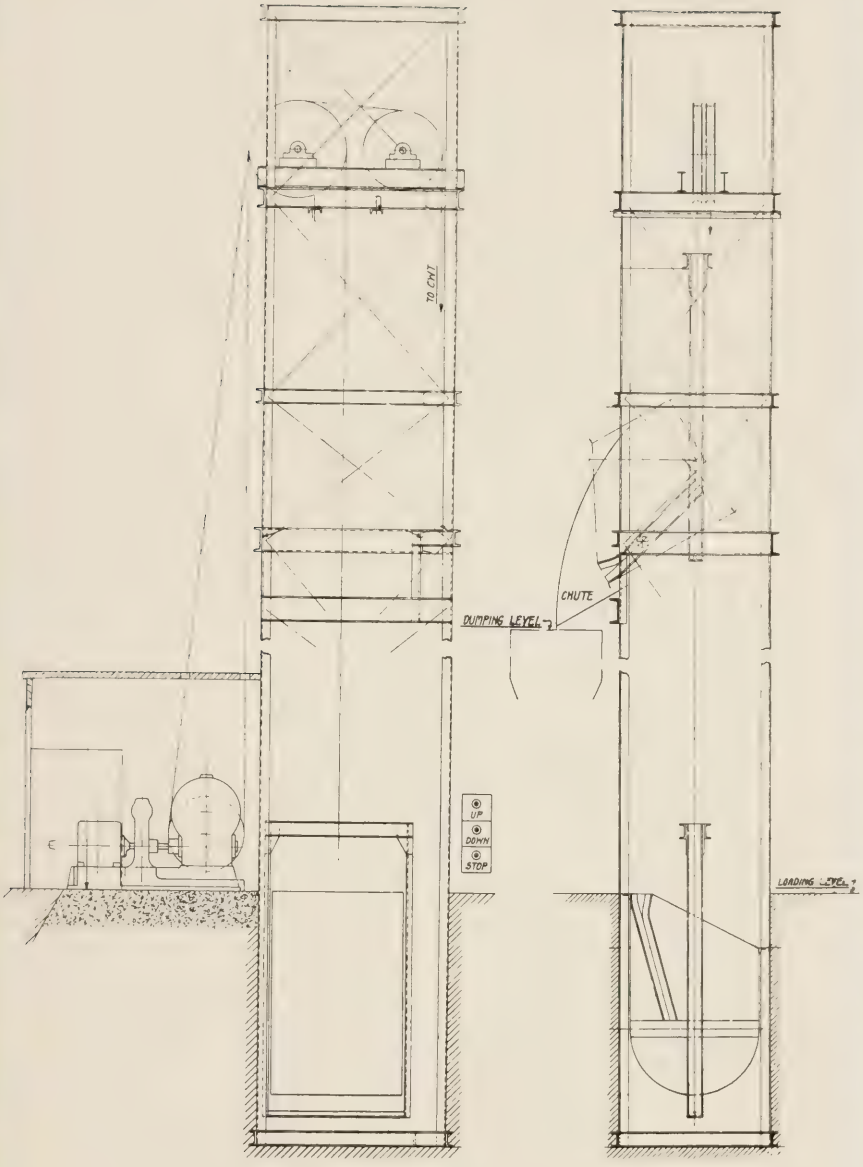
Section of Tower Showing Bucket, Cams, Trunnions,
Brackets, Guides, etc.

pose. At the position where the bucket starts to swing, the angle iron guides are cut so that the brackets can pass through the guides and permit the bucket to swing. The usual arrangement of bucket, cams, rollers, etc., is shown in the illustration on page 11.

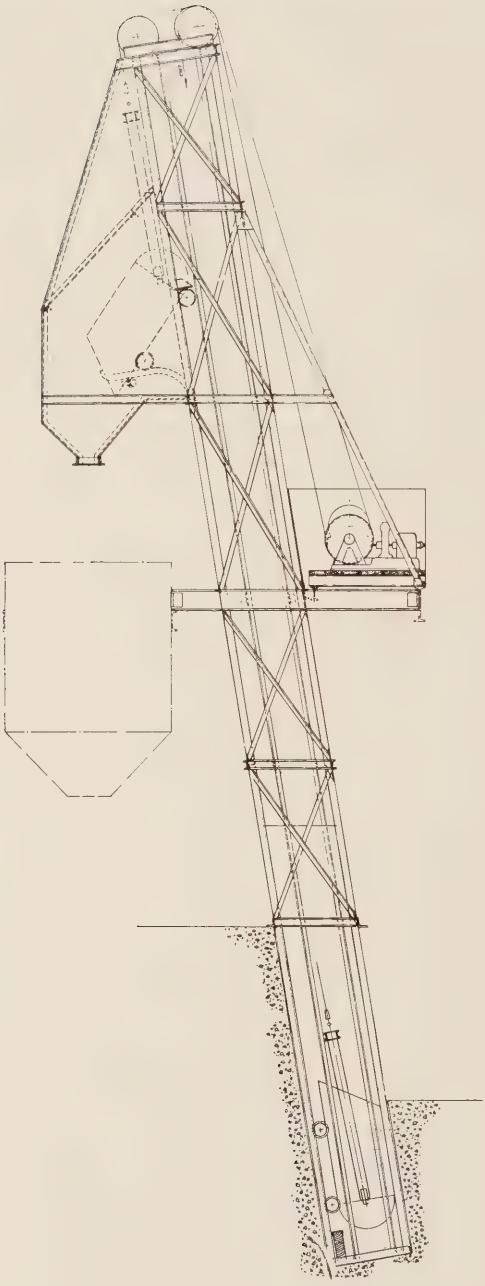
Where the material is to be hoisted on an incline, the bucket is equipped with four flanged wheels as illustrated in the diagram on page 14. These wheels usually run on standard light weight railway tracks and by the use of double treads on one pair of wheels and additional tracks at the dumping point, the bucket is dumped without the use of the cams and rollers which are necessary on the vertical type of hoist.

The hoistway for the travel of the bucket may be a steel tower, a concrete hatch or well-way or any other desired form of construction.

On single bucket installations the question of whether a counterweight is required is one depending entirely upon the load and speed conditions. For light loads and slow speeds it is usually unnecessary to install a counterweight.

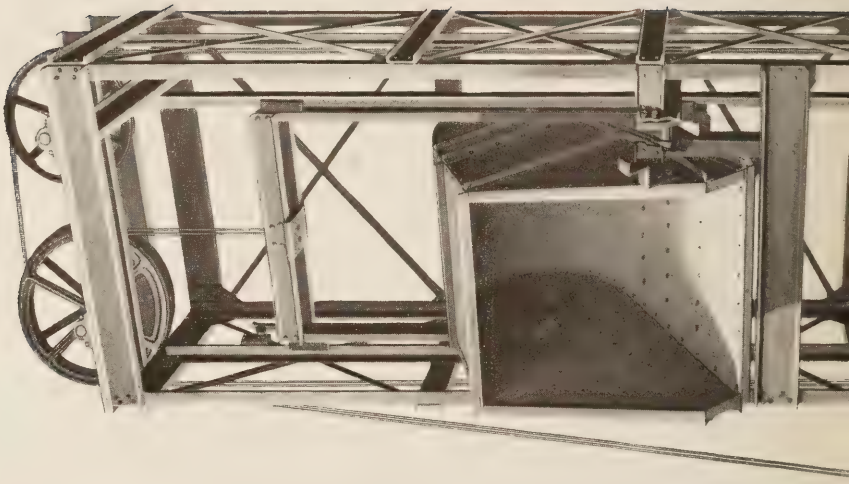


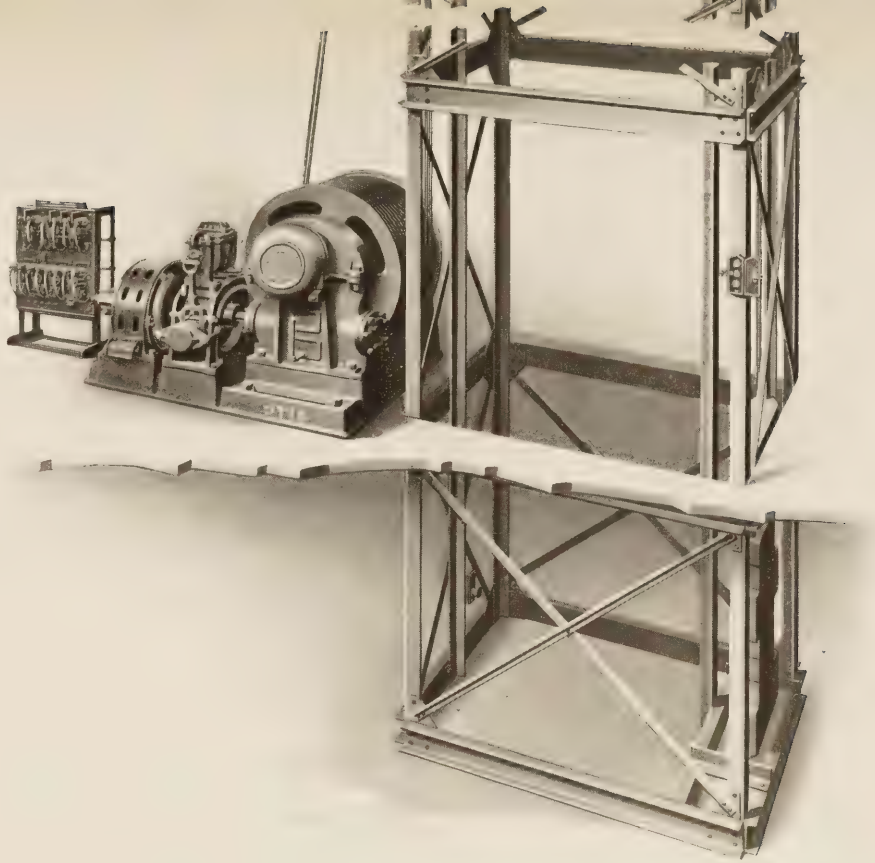
Typical Layout of Otis Automatic Push Button Skip Hoist
with Machine Located at Loading Level.
Arranged for Vertical Hoisting.



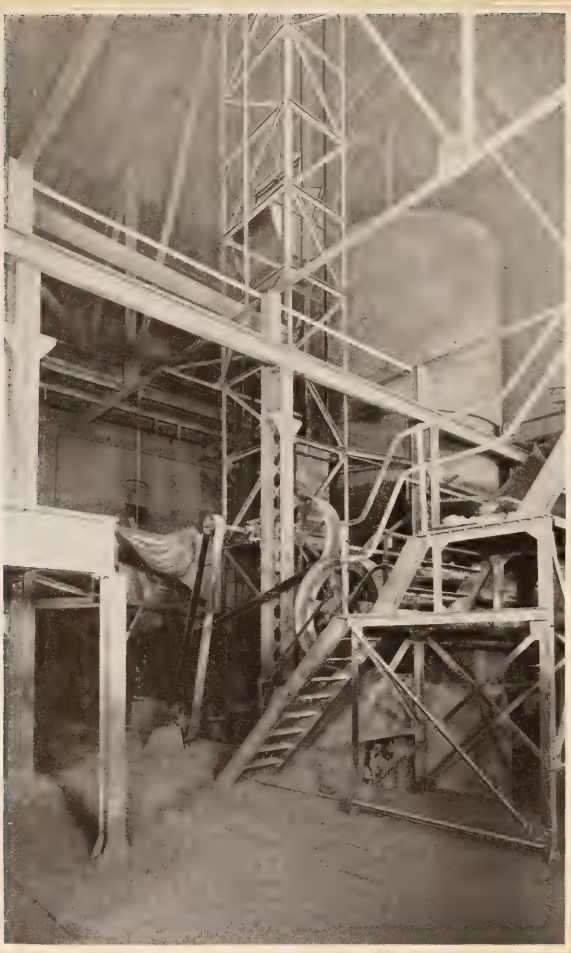
Typical Layout of Otis Automatic Push Button Skip Hoist
Arranged for Hoisting on an Incline.

SOME TYPICAL INSTALLATIONS OF OTIS SKIP HOISTS IN MANUFACTURING PLANTS, COAL AND COKE PLANTS, GAS, ELECTRIC LIGHT AND POWER STATIONS



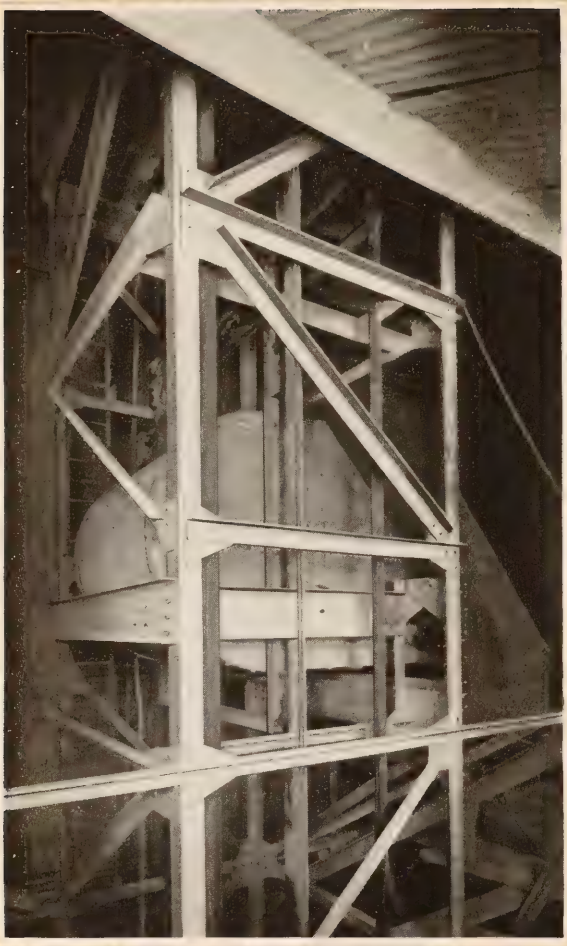


Typical Complete Installation of Otis Automatic
Push Button Skip Hoist.

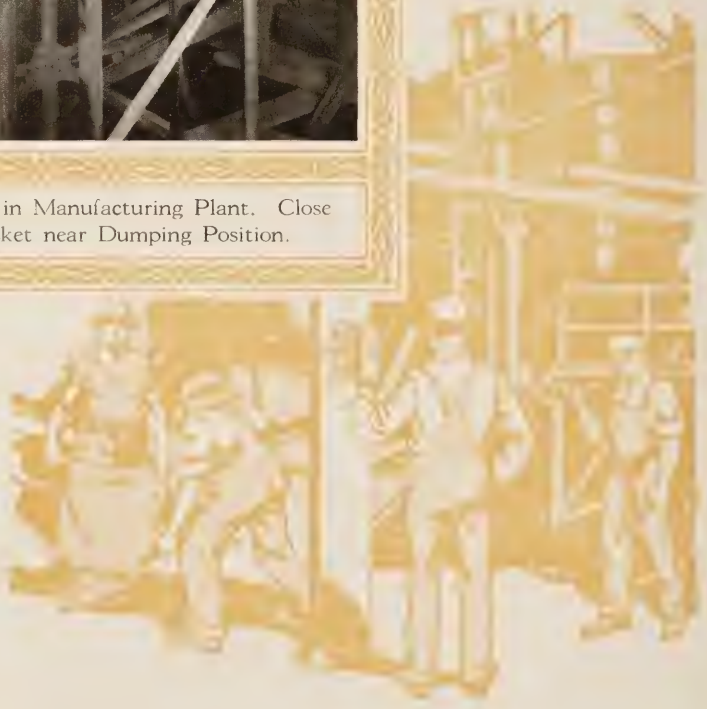


Otis Automatic Skip Hoist handling hot calcium carbide in a Manufacturing Plant.

Otis Skip Hoist in Manufacturing Plant,
Showing Bucket near Dumping Position.



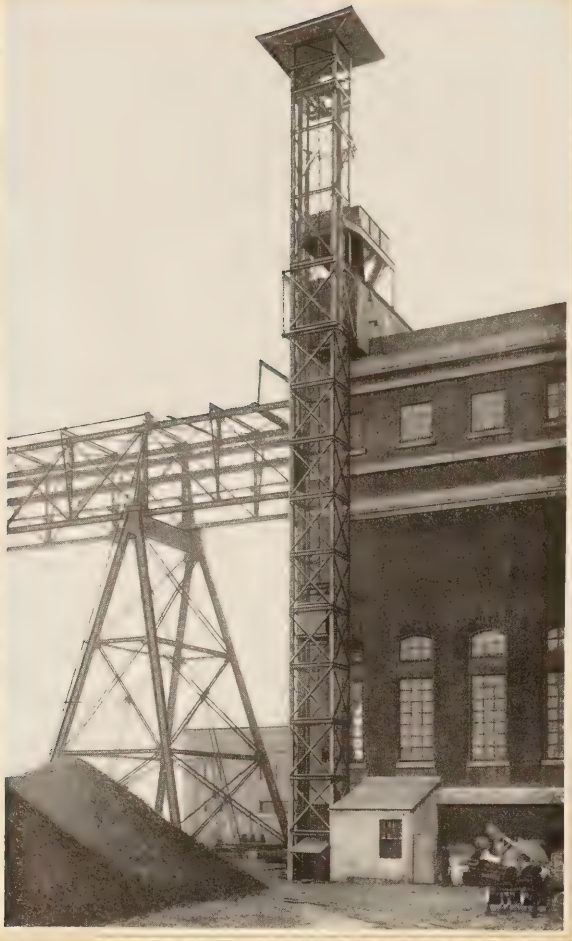
Otis Skip Hoist in Manufacturing Plant. Close View of Bucket near Dumping Position.



Otis Inclined Automatic Skip Hoist Handling Ashes
in a Coal and Coke Plant. Bucket Ascending.

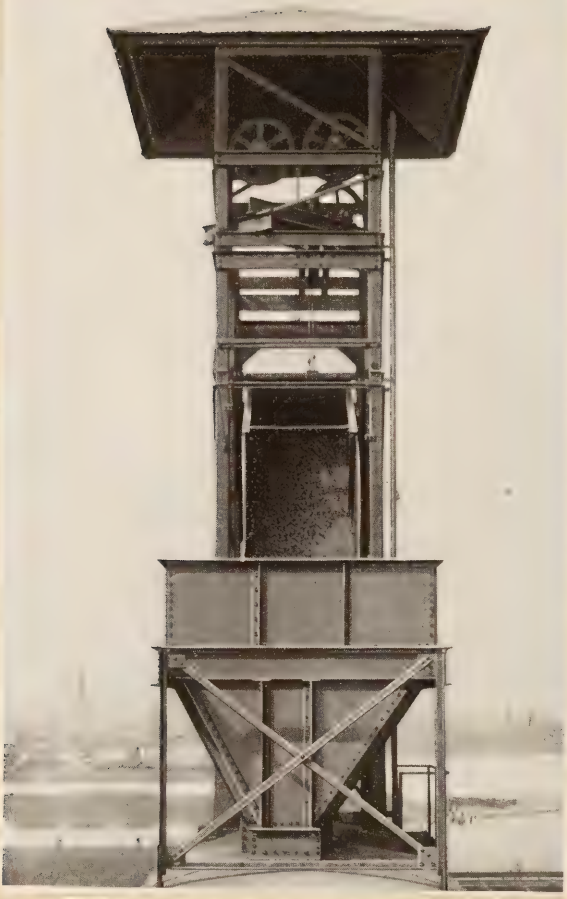
Otis Skip Hoist Handling Ashes in Coal and Coke Plant. Bucket Approaching Dumping Position.

Otis Skip Hoist Handling Ashes in a Coal and Coke Plant. Bucket at Loading Point.

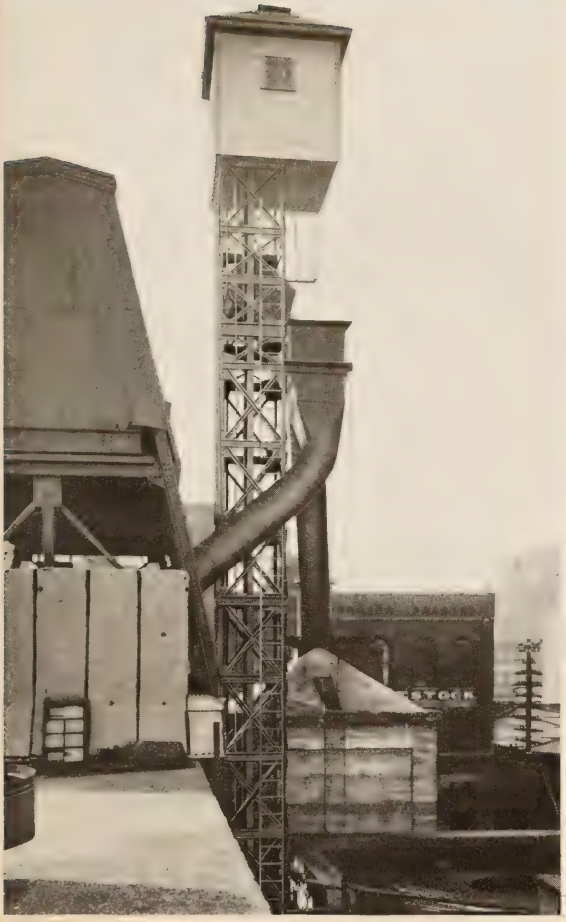


Otis Automatic Skip Hoist Handling Coal in a Gas, Electric Light and Power Plant.

Otis Skip Hoist Handling Coal. Side View of Bucket in Dumping Position.



Otis Skip Hoist Handling Coal. Front View of Bucket in Dumping Position.



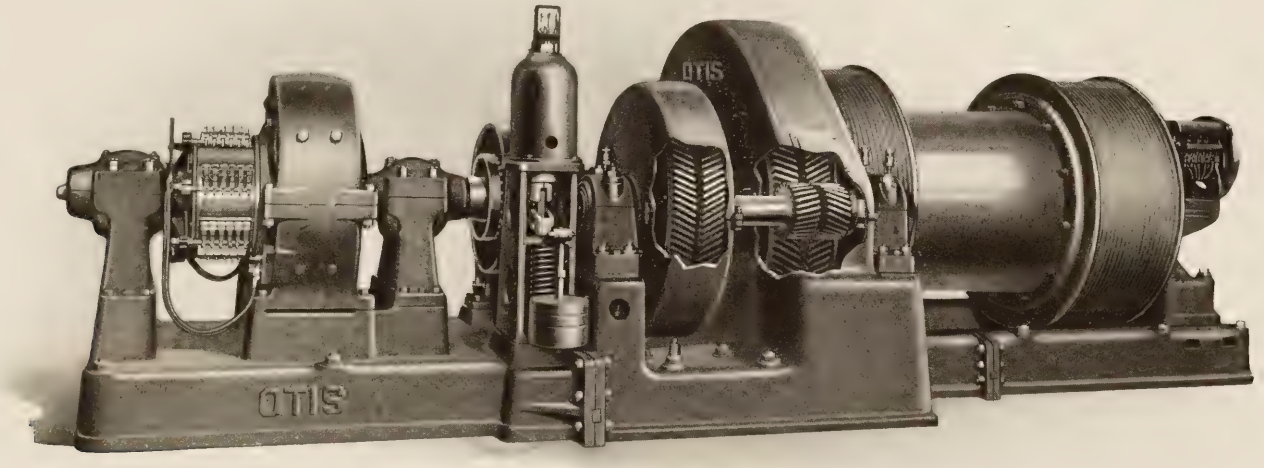
Otis Automatic Skip Hoist Handling Ashes
in an Electric Light and Power Plant.

OTIS
SKIP HOISTS

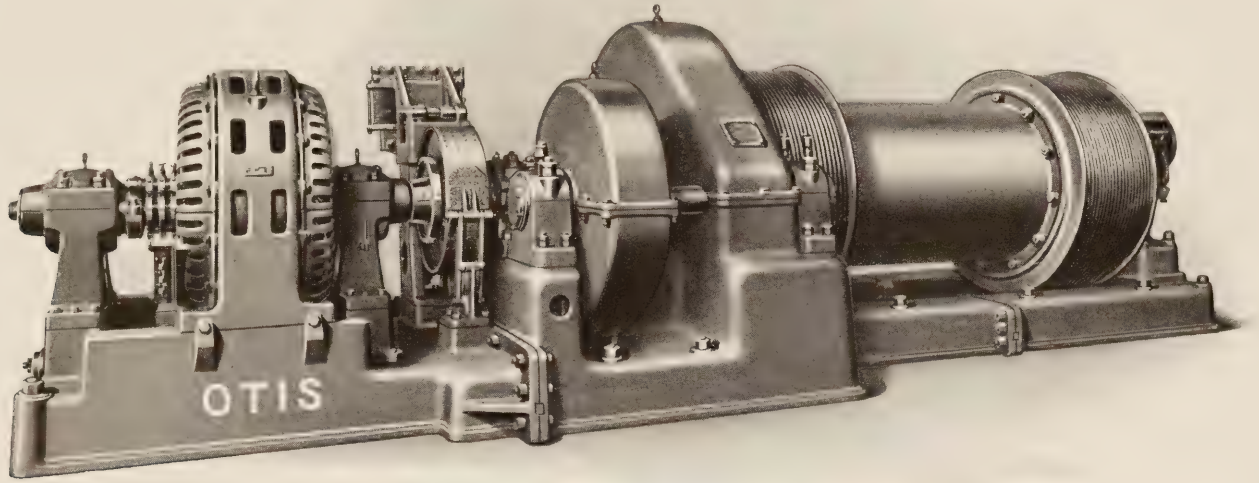
For Blast Furnace Skips, Inclined Railways and Similar Installations.

This booklet would be incomplete without the mention of another class of hoisting machines which we manufacture for heavier duties than can be taken care of by standard elevator machines. These are the Herringbone Gear, Single and Double Drum Hoists used for Blast Furnace Skips, large Inclined Railways and similar installations where heavy duty hoists with automatic control are required.

A typical direct current machine is shown on Page 29 and one of the alternating current type on Page 30.



Otis Double Drum Skip Hoist driven by an Otis Direct Current Interpole Variable Speed Motor of 250 H. P.
Equipped with two External Herringbone Gear Reductions Fully Enclosed and Running in Oil Baths.



Otis Double Drum Skip Hoist driven by an Otis Alternating Current Two Speed Motor of 250 H. P. and Operated by Full Alternating Current Magnet Controller, and with Alternating Current Brake. Equipped with Two External Herringbone Gear Reductions Fully Enclosed and Running in Oil Baths.

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